CLAIMS. 9 of an injection moulded polymer component

1. A method of metallizing a solid polymer substrate comprising the steps of

a) generating radicals on the substrate surface by subjecting it to a gas plasma,

b) forming a layer on the surface using a plasma enhanced polymerisation process employing one or more monomers comprising monomers selected among cyano acrylate, mono- and diacrylates, such as acrylic acid, triethylen glycol diacrylate, glycidyl acrylate, isocyanates, ~~/such as/~~ 1,4-diisocyanobutane, toluenediisocyanate, epoxy compounds, such as glycidyl methacrylate, preferably 2,3-epoxypropyl methacrylate, allylic and vinylic compounds, ~~/such as/~~ vinyl acetic acid, vinyl norbonene, vinyl pyrrolidone, vinyl trimethoxysilane, vinyl trimethylsilane allylene, allylalcohol, allyloxymethylsilane, allylphenol, allylurea 1-allyltheourea(thiosineamine),

c) providing a short surface deposition using a PVD or CVD process to deposit metal atoms, such as copper, tin, silver palladium, platinum, or gold, and

d) optionally providing a metallization of the surface by using a conventional electroless bath, or

avoiding electroless metallization by using direct electrolytic metallization, when the metal layer formed in c) has a thickness allowing electrolytic metallization.

2. A method according to claim 1, wherein the (~~catalytic~~ metal) comprises Pt, Ag, Pd, Cu and Au.

2 x + — preferably selected from the group consisting of

(—) metal layer

3. A method according to claim 1, wherein the monomer or monomer mixture comprises one or more of cyanoacrylate and glycidyl metacrylate, preferably 2,3-epoxypropyl methacrylate.

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4. A method according to each of the preceding claims 1, 2 or 3, wherein step b) comprises treatment of the surface with a monomer vapour comprising 0.5 to 90 mole-%, preferably between 10 and 60 mole % of 2-ethyl cyano acrylate vapour.

5. A method according to claim 4, wherein the monomer prior to the vaporisation consists essentially of 2-ethyl cyano acrylate, an acid having a partial vapour pressure in the plasma which is lower than the partial vapour pressure of 2-ethyl cyano-acrylate, and up to 40 weight-% of another filler, preferably an acid having a partial vapour pressure in the plasma which is lower than half the partial vapour pressure of 2-ethyl cyano-acrylate, most preferably the acid is a polyphosphoric acid and is present prior to the vaporisation in a concentration up to 10 weight-%.

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6. A method according to each of the preceding claims, wherein the polymer substrate is a polyolefine type, such as PE, PP, or an aryl type, such as styrene, a diene type, such as polybutadiene, polyisoprene, a silicone type, such as silicone rubber, a fluorine type, such as polytetrafluorethylene or its copolymers.

7. A method according to each of the preceding claims 1-5, wherein the polymer substrate is a PTFE ~~and~~ PP.

~~8. A method according to each of the preceding claims,~~ wherein the polymer substrate is an injection moulded

polymer component, a polymer fibre, a polymer thread or a polymer filler.

8 9. A method according to each of the preceding claims, wherein step a) comprises the generation of radicals by use of a gas plasma generated by excitation of the gas in a direct current (DC), low frequency (LF), audio frequency (AF), radio frequency (RF) or microwave generated electric field.

9 10. A method according to each of the preceding claims, wherein the monomer pressure in step b) is between 0.1 and 100000 Pa, preferably between 10 and 1000 Pa.

10 11. A method according to each of the preceding claims, wherein the generation step a) is carried out for a period of between 0.01 and 1000 seconds, and the treatment step b) is carried out for a period of between 0.1 and 1000 seconds.

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10 12. A method according to claim 11, wherein step a) is carried out for more than 30 seconds, and step b) is started 10 to 30 seconds after step a).

10 12 13. A method according claim 11, wherein the generation step a) is carried out for a period of between 10 and 60 seconds, and the treatment step b) is carried out for a period of between 10 and 200 seconds.

SUB A3 13 14. A method according to each of the preceding claims, wherein the temperature is the same under both step a) and step b), and preferably the temperature under both step a) and step b) is between 250 and 450 K, most preferably between 280 and 330 K.

END

14 15. A method according to each of the preceding claims, wherein the total pressure under step a) is equal to the total pressure under step b), the total pressure is preferably between 0.2 and 100000 Pa, more preferably between 0.2 and 10000 Pa, and most preferably between 10 and 1000 Pa.

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15 16. A method according to claim 1, where step b) starts before step a) provided that step b) does not terminate until step a) is started, simultaneously with step a), under step a), or follows immediately after step a), where step c) starts before step b), simultaneously with step b), follows immediately after step b) or within 8 months after step b), preferably within 6 months, and where step d) follows step c) or starts simultaneously with step d).

SUB A4

16 17. A polymer substrate metallized according to the method of each of the preceding claims 1-16.

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ADD A5